

# Project 169



**Coding  
School**

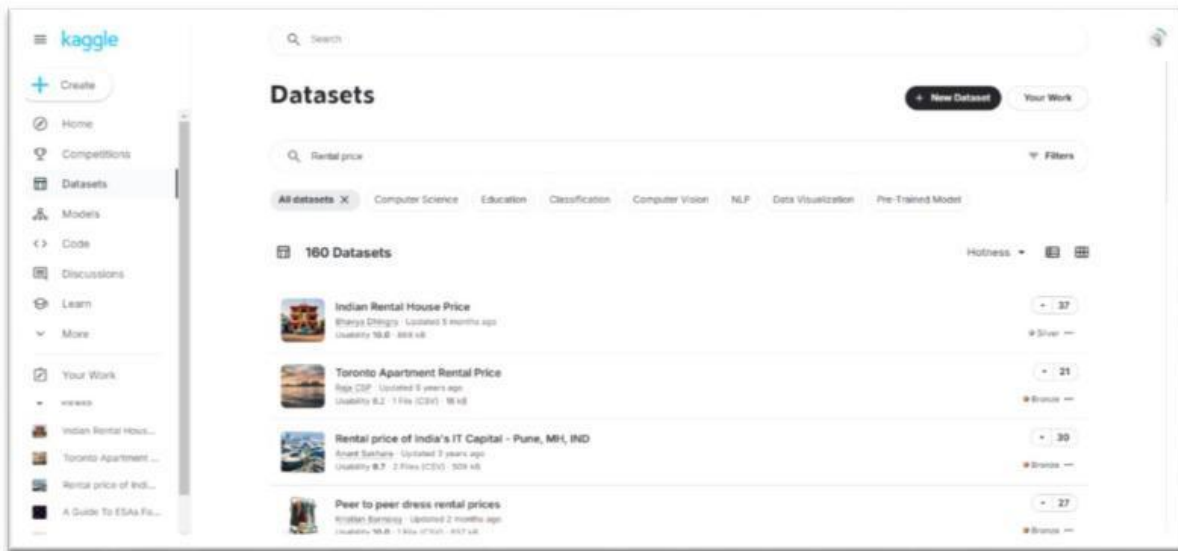


## AI and Machine Learning

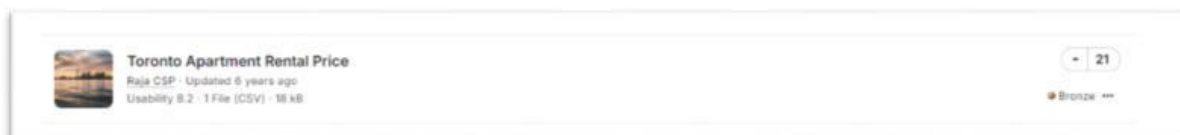


**Start here**

- ❖ In this homework, let's train a machine learning model using a dataset from the kaggle website and use that model to create a mobile app through the App lab.
- ❖ Let's create an app to calculate the rental price of houses or apartments.
- ❖ First log into your kaggle website account.
- ❖ Now click on the Datasets tab in the side bar.
- ❖ Search as rental price.



- ❖ Select the dataset as Toronto Apartment Rental Price among them.
- ❖ Click on Download and download the dataset and extract the dataset.





RAJA CSP · UPDATED 6 YEARS AGO

21

New Notebook

Download (18 kB)



## Toronto Apartment Rental Price

Apartment Rental price list - Toronto



Data Card Code (4) Discussion (0) Suggestions (0)

### About Dataset

#### Context

I have collected the Toronto Apartment Rental prices from various sources in local websites.

#### Content

There are 7 columns in the dataset.

Bedroom - How many bedrooms available

Bathroom - How many bathrooms available

Den - Whether den is available or not

Address - Location

#### Usability

8.24

#### License

CC0: Public Domain

#### Expected update frequency

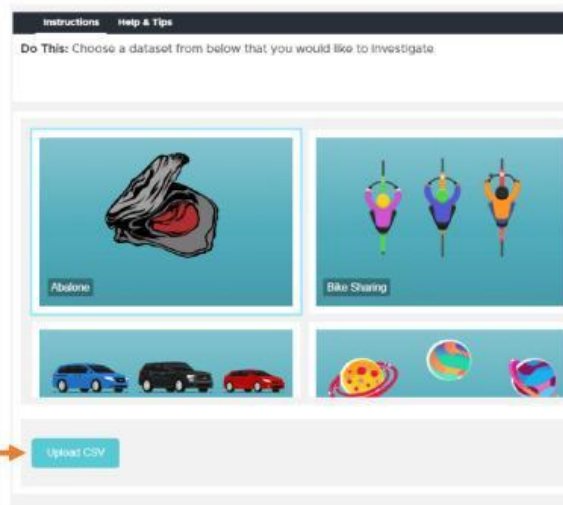
Quarterly

#### Tags

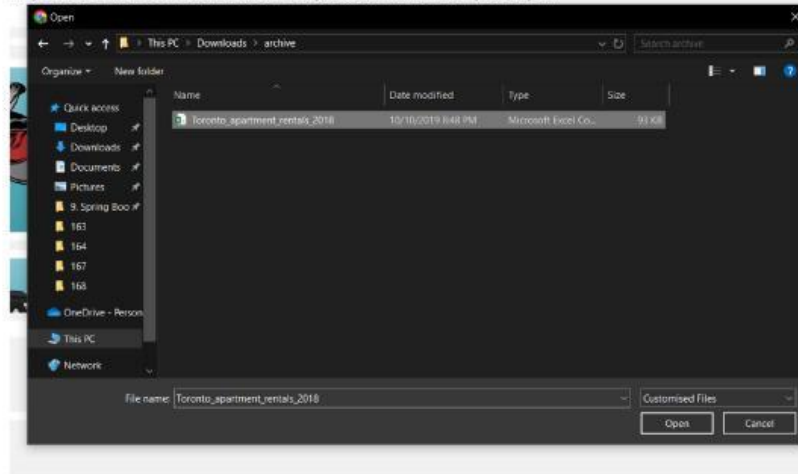
Business

Internet

- ❖ Now click on the start button in the homework and open the AI and machine learning lab.
- ❖ Click on the Upload CSV button and upload the downloaded Toronto\_apartment\_rentals\_2018 dataset to AI and machine learning lab..



urvey data, or choose from a dataset below that you would like to use for your project.



- ❖ There are 1124 rows in that data set.
- ❖ Now click on the Continue button.
- ❖ What is done here is to measure an app to predict the rental price of apartments.
- ❖ To predict the rental price, the price column should be selected.
- ❖ But here the price column cannot be selected.

Predict   based on  

| Bedroom | Bathroom | Den | Address                                                                    | Lat        | Long        | Price      |
|---------|----------|-----|----------------------------------------------------------------------------|------------|-------------|------------|
| 2       | 2        | 0   | 3985 Grand Park Drive, 3985 Grand Park Dr, Mississauga, ON L5B 0H8, Canada | 43.5816391 | -79.648193  | \$2,450.00 |
| 1       | 1        | 1   | 361 Front St W, Toronto, ON M5V 3R5, Canada                                | 43.6430505 | -79.3916429 | \$2,150.00 |
| 1       | 1        | 0   | 89 McCall Street, Toronto, ON, M5B 0B1                                     | 43.6606054 | -79.3786354 | \$1,950.00 |
| 2       | 2        | 0   | 10 York Street, Toronto, ON, M5J 0E1                                       | 43.6410868 | -79.3814048 | \$2,900.00 |
| 1       | 1        | 0   | 80 St Patrick St, Toronto, ON M5T 2X6, Canada                              | 43.6524873 | -79.3886219 | \$1,500.00 |
| 1       | 1        | 0   | 87 Jameson Avenue, Toronto, ON, M8K 2W8                                    | 43.6349903 | -79.4349541 | \$1,729.00 |
| 2       | 1        | 0   | 700 Ross Street, Burlington, ON, L7S 1S2                                   | 43.3289655 | -79.8066183 | \$1,588.00 |
| 1       | 1        | 0   | 25 Telegram Mews, Toronto, ON, M5V 3Z2                                     | 43.6409179 | -79.3939821 | \$1,900.00 |
| 1       | 1        | 0   | 560 Front St W, Toronto, ON, M5V 0L5                                       | 43.6413078 | -79.4003933 | \$1,900.00 |
| 1       | 1        | 1   | 70 Queens Wharf Rd 33rd Floor, Toronto, ON M5V 0J2, Canada                 | 43.6400685 | -79.3899804 | \$2,400.00 |
| 1       | 1        | 0   | 545 - 555 Sherbourne Street, Toronto, ON, M4X 1W5                          | 43.6684679 | -79.3748336 | \$1,750.00 |
| 2       | 1        | 0   | 545 - 555 Sherbourne Street, Toronto, ON, M4X 1W5                          | 43.6684679 | -79.3748336 | \$2,000.00 |

There are 1124 rows of data. (Showing first 100 rows)

Price

Data Type  
categorical

Column Information  
168 values were found in this column. A graph is only shown when there are 5 or fewer.

Note  
Categorical columns with more than 50 unique values can not be selected as the label or a feature.

- ❖ Here the price column cannot be selected because there are values in the price column with the \$ symbol. Therefore, the AI lab cannot identify the values in the price column as numbers.

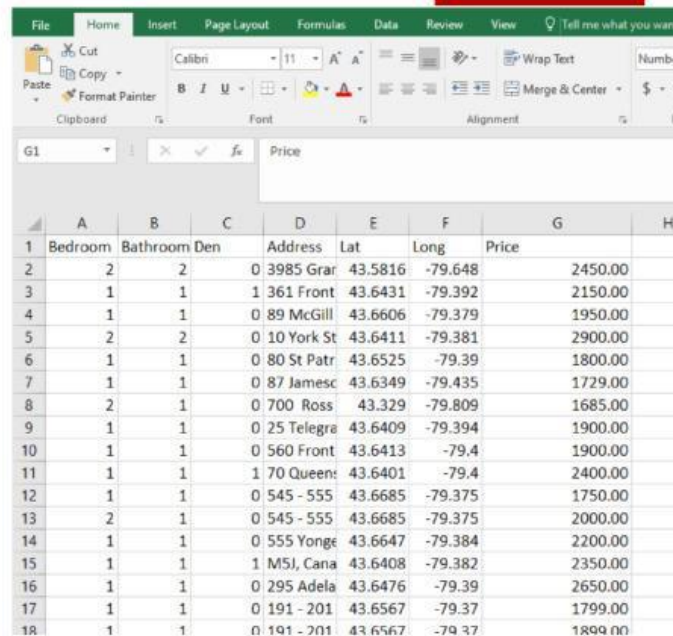
- ❖ Open the dataset Toronto\_apartment\_rentals\_2018 in Excel.

|    | A       | B        | C   | D            | E        | F        | G          | H | I | J | K | L | M | N | O | P |
|----|---------|----------|-----|--------------|----------|----------|------------|---|---|---|---|---|---|---|---|---|
| 1  | Bedroom | Bathroom | Den | Address      | Lat      | Long     | Price      |   |   |   |   |   |   |   |   |   |
| 2  | 2       | 2        | 0   | 3985 Gran    | 43.58164 | -79.6482 | \$2,450.00 |   |   |   |   |   |   |   |   |   |
| 3  | 1       | 1        | 1   | 1361 Front   | 43.64305 | -79.3916 | \$2,150.00 |   |   |   |   |   |   |   |   |   |
| 4  | 1       | 1        | 1   | 089 McGill   | 43.66061 | -79.3786 | \$1,950.00 |   |   |   |   |   |   |   |   |   |
| 5  | 2       | 2        | 0   | 10 York St   | 43.64109 | -79.3814 | \$2,900.00 |   |   |   |   |   |   |   |   |   |
| 6  | 1       | 1        | 1   | 080 St Patri | 43.65249 | -79.3896 | \$1,800.00 |   |   |   |   |   |   |   |   |   |
| 7  | 1       | 1        | 1   | 087 James    | 43.63489 | -79.4347 | \$1,729.00 |   |   |   |   |   |   |   |   |   |
| 8  | 2       | 1        | 1   | 0700 Ross    | 43.32899 | -79.8086 | \$1,685.00 |   |   |   |   |   |   |   |   |   |
| 9  | 1       | 1        | 1   | 025 Telegra  | 43.64092 | -79.394  | \$1,900.00 |   |   |   |   |   |   |   |   |   |
| 10 | 1       | 1        | 1   | 0560 Front   | 43.64131 | -79.4001 | \$1,900.00 |   |   |   |   |   |   |   |   |   |
| 11 | 1       | 1        | 1   | 170 Queens   | 43.64007 | -79.4    | \$2,400.00 |   |   |   |   |   |   |   |   |   |
| 12 | 1       | 1        | 1   | 0545 - 555   | 43.66847 | -79.3748 | \$1,750.00 |   |   |   |   |   |   |   |   |   |
| 13 | 2       | 1        | 1   | 0545 - 555   | 43.66847 | -79.3748 | \$2,000.00 |   |   |   |   |   |   |   |   |   |
| 14 | 1       | 1        | 1   | 0555 Yonge   | 43.66472 | -79.3841 | \$2,200.00 |   |   |   |   |   |   |   |   |   |
| 15 | 1       | 1        | 1   | 1 M5J, Cana  | 43.64082 | -79.3818 | \$2,350.00 |   |   |   |   |   |   |   |   |   |
| 16 | 1       | 1        | 1   | 0295 Adela   | 43.64763 | -79.3904 | \$2,650.00 |   |   |   |   |   |   |   |   |   |
| 23 | 1       | 1        | 1   | 07934 Kipli  | 43.78319 | -79.5986 | \$1,750.00 |   |   |   |   |   |   |   |   |   |
| 26 | 2       | 2        | 0   | York St, Tc  | 43.64231 | -79.3812 | \$3,100.00 |   |   |   |   |   |   |   |   |   |
| 27 | 2       | 2        | 0   | 10 Park La   | 43.62329 | -79.4837 | \$2,999.00 |   |   |   |   |   |   |   |   |   |
| 28 | 1       | 1        | 1   | 0, Toronto   | 43.75989 | -79.4431 | \$1,250.00 |   |   |   |   |   |   |   |   |   |
| 29 | 1       | 1        | 1   | 033 Gamble   | 43.68936 | -79.3528 | \$1,825.00 |   |   |   |   |   |   |   |   |   |

|    | A       | B        | C   | D            | E       | F        | G     | H | I | J | K | L | M | N | O | P |
|----|---------|----------|-----|--------------|---------|----------|-------|---|---|---|---|---|---|---|---|---|
| 1  | Bedroom | Bathroom | Den | Address      | Lat     | Long     | Price |   |   |   |   |   |   |   |   |   |
| 2  | 2       | 2        | 0   | 3985 Gran    | 43.5816 | -79.6482 |       |   |   |   |   |   |   |   |   |   |
| 3  | 1       | 1        | 1   | 1361 Front   | 43.6431 | -79.3916 |       |   |   |   |   |   |   |   |   |   |
| 4  | 1       | 1        | 1   | 089 McGill   | 43.6606 | -79.3786 |       |   |   |   |   |   |   |   |   |   |
| 5  | 2       | 2        | 0   | 10 York St   | 43.6411 | -79.3814 |       |   |   |   |   |   |   |   |   |   |
| 6  | 1       | 1        | 1   | 080 St Patri | 43.6525 | -79.3896 |       |   |   |   |   |   |   |   |   |   |
| 7  | 1       | 1        | 1   | 087 James    | 43.6349 | -79.4347 |       |   |   |   |   |   |   |   |   |   |
| 8  | 2       | 1        | 1   | 0700 Ross    | 43.329  | -79.8086 |       |   |   |   |   |   |   |   |   |   |
| 9  | 1       | 1        | 1   | 025 Telegra  | 43.6409 | -79.394  |       |   |   |   |   |   |   |   |   |   |
| 10 | 1       | 1        | 1   | 0560 Front   | 43.6413 | -79.4001 |       |   |   |   |   |   |   |   |   |   |
| 11 | 1       | 1        | 1   | 170 Queens   | 43.6401 | -79.4    |       |   |   |   |   |   |   |   |   |   |
| 12 | 1       | 1        | 1   | 0545 - 555   | 43.6685 | -79.3748 |       |   |   |   |   |   |   |   |   |   |
| 13 | 2       | 1        | 1   | 0545 - 555   | 43.6685 | -79.3748 |       |   |   |   |   |   |   |   |   |   |
| 14 | 1       | 1        | 1   | 0555 Yonge   | 43.6647 | -79.3841 |       |   |   |   |   |   |   |   |   |   |

- ❖ Now click on g column and go to home tab.
- ❖ Now click on the drop down in the red box above.

- ❖ Select Number from the drop down.
- ❖ Then the \$ symbol in the price column will be removed. Now save this excel file.



|    | A       | B        | C   | D                                                                          | E       | F       | G       | H |
|----|---------|----------|-----|----------------------------------------------------------------------------|---------|---------|---------|---|
| 1  | Bedroom | Bathroom | Den | Address                                                                    | Lat     | Long    | Price   |   |
| 2  | 2       | 2        | 0   | 3985 Grand Park Drive, 3985 Grand Park Dr, Mississauga, ON L5B 0H6, Canada | 43.5816 | -79.648 | 2450.00 |   |
| 3  | 1       | 1        | 1   | 361 Front St W, Toronto, ON M5V 3R5, Canada                                | 43.6431 | -79.392 | 2150.00 |   |
| 4  | 1       | 1        | 0   | 89 McGill Street, Toronto, ON, M5G 0B1                                     | 43.6606 | -79.379 | 1950.00 |   |
| 5  | 2       | 2        | 0   | 10 York Street, Toronto, ON, M5J 0E1                                       | 43.6411 | -79.381 | 2900.00 |   |
| 6  | 1       | 1        | 0   | 80 St Patrick St, Toronto, ON M5T 2K6, Canada                              | 43.6525 | -79.39  | 1800.00 |   |
| 7  | 1       | 1        | 0   | 87 Jameson Avenue, Toronto, ON, M8K 2W8                                    | 43.6349 | -79.435 | 1729.00 |   |
| 8  | 2       | 1        | 0   | 700 Ross Street, Burlington, ON, L7S 1S2                                   | 43.329  | -79.809 | 1685.00 |   |
| 9  | 1       | 1        | 0   | 25 Telegram Mews, Toronto, ON, M6V 3Z2                                     | 43.6409 | -79.394 | 1900.00 |   |
| 10 | 1       | 1        | 0   | 560 Front St W, Toronto, ON, M5V 0L5                                       | 43.6413 | -79.4   | 1900.00 |   |
| 11 | 1       | 1        | 1   | 70 Queens Wharf Rd 33rd Floor, Toronto, ON M5V 0J2, Canada                 | 43.6401 | -79.4   | 2400.00 |   |
| 12 | 1       | 1        | 0   | 545 - 555 Sherbourne Street, Toronto, ON, M4X 1W5                          | 43.6685 | -79.375 | 1750.00 |   |
| 13 | 2       | 1        | 0   | 545 - 555 Sherbourne Street, Toronto, ON, M4X 1W5                          | 43.6685 | -79.375 | 2000.00 |   |
| 14 | 1       | 1        | 0   | 555 Yonge                                                                  | 43.6647 | -79.384 | 2200.00 |   |
| 15 | 1       | 1        | 1   | M5J, Canada                                                                | 43.6408 | -79.382 | 2350.00 |   |
| 16 | 1       | 1        | 0   | 295 Adelaide                                                               | 43.6476 | -79.39  | 2650.00 |   |
| 17 | 1       | 1        | 0   | 191 - 201                                                                  | 43.6567 | -79.37  | 1799.00 |   |
| 18 | 1       | 1        | 0   | 191 - 201                                                                  | 43.6567 | -79.37  | 1899.00 |   |

- ❖ Now upload the saved dataset to AI and machine learning lab.
- ❖ Click on the Continue button.
- ❖ Now the price column can be selected to predict the rental price.

Predict
based on

| Bedroom | Bathroom | Den | Address                                                                    | Lat        | Long        | Price   |
|---------|----------|-----|----------------------------------------------------------------------------|------------|-------------|---------|
| 2       | 2        | 0   | 3985 Grand Park Drive, 3985 Grand Park Dr, Mississauga, ON L5B 0H6, Canada | 43.5816391 | -79.648193  | 2450.00 |
| 1       | 1        | 1   | 361 Front St W, Toronto, ON M5V 3R5, Canada                                | 43.6430505 | -79.3916429 | 2150.00 |
| 1       | 1        | 0   | 89 McGill Street, Toronto, ON, M5G 0B1                                     | 43.6606054 | -79.3795354 | 1950.00 |
| 2       | 2        | 0   | 10 York Street, Toronto, ON, M5J 0E1                                       | 43.6410888 | -79.3814048 | 2900.00 |
| 1       | 1        | 0   | 80 St Patrick St, Toronto, ON M5T 2K6, Canada                              | 43.6524873 | -79.3995218 | 1800.00 |
| 1       | 1        | 0   | 87 Jameson Avenue, Toronto, ON, M8K 2W8                                    | 43.6348903 | -79.4348541 | 1729.00 |
| 2       | 1        | 0   | 700 Ross Street, Burlington, ON, L7S 1S2                                   | 43.3289895 | -79.8086183 | 1685.00 |
| 1       | 1        | 0   | 25 Telegram Mews, Toronto, ON, M6V 3Z2                                     | 43.6409179 | -79.3939821 | 1900.00 |
| 1       | 1        | 0   | 560 Front St W, Toronto, ON, M5V 0L5                                       | 43.6413078 | -79.4000833 | 1900.00 |
| 1       | 1        | 1   | 70 Queens Wharf Rd 33rd Floor, Toronto, ON M5V 0J2, Canada                 | 43.6400895 | -79.3999804 | 2400.00 |
| 1       | 1        | 0   | 545 - 555 Sherbourne Street, Toronto, ON, M4X 1W5                          | 43.6684679 | -79.3748336 | 1750.00 |
| 2       | 1        | 0   | 545 - 555 Sherbourne Street, Toronto, ON, M4X 1W5                          | 43.6684679 | -79.3748336 | 2000.00 |

There are 1124 rows of data. (Showing first 100 rows)

Price

Data Type  
numerical

Column information  
min 65  
max 535000  
range 534935

Select label

- ❖ දැන් continue button එක මත click කරන්න.
- ❖ දැන් base on සඳහා column select කර ගන්න.

Predict **Price** based on **Bedroom**, **Bathroom**, **Den**, **Lat**, **Long**

| Bedroom | Bathroom | Den | Address                                                                    | Lat        | Long        | Price   |
|---------|----------|-----|----------------------------------------------------------------------------|------------|-------------|---------|
| 2       | 2        | 0   | 3985 Grand Park Drive, 3985 Grand Park Dr, Mississauga, ON L5B 0H8, Canada | 43.5816391 | -79.848193  | 2450.00 |
| 1       | 1        | 1   | 361 Front St W, Toronto, ON M5V 3R5, Canada                                | 43.6430505 | -79.3916429 | 2150.00 |
| 1       | 1        | 0   | 89 McGill Street, Toronto, ON, M5B 0B1                                     | 43.6606054 | -79.3786354 | 1950.00 |
| 2       | 2        | 0   | 10 York Street, Toronto, ON, M5J 0E1                                       | 43.6410868 | -79.3814048 | 2900.00 |
| 1       | 1        | 0   | 80 St Patrick St, Toronto, ON M5T 2X6, Canada                              | 43.6524873 | -79.3896218 | 1800.00 |
| 1       | 1        | 0   | 87 Jameson Avenue, Toronto, ON, M6K 2W8                                    | 43.6348903 | -79.4346541 | 1729.00 |
| 2       | 1        | 0   | 700 Ross Street, Burlington, ON, L7S 1S2                                   | 43.3289855 | -79.8086183 | 1685.00 |
| 1       | 1        | 0   | 25 Telegram Mews, Toronto, ON, M5V 3Z2                                     | 43.6409179 | -79.3939821 | 1900.00 |
| 1       | 1        | 0   | 560 Front St W, Toronto, ON, M5V 0L5                                       | 43.6413078 | -79.4000933 | 1900.00 |
| 1       | 1        | 1   | 70 Queens Wharf Rd 33rd Floor, Toronto, ON M5V 0J2, Canada                 | 43.6400685 | -79.3999604 | 2400.00 |
| 1       | 1        | 0   | 545 - 555 Sherbourne Street, Toronto, ON, M4X 1W5                          | 43.6684679 | -79.3748336 | 1750.00 |
| 2       | 1        | 0   | 545 - 555 Sherbourne Street, Toronto, ON, M4X 1W5                          | 43.6684679 | -79.3748336 | 2000.00 |

There are 1124 rows of data. (Showing first 100 rows)

- ❖ Now click on train.
- ❖ Then when the rent price was predicted according to the number of bedrooms, number of bathrooms, number of storage rooms and location in the apartment, a good value accuracy of 98.23% was obtained.

## Result

Accuracy

Predict **Price** based on **Bedroom**, **Bathroom**, **Den**, **Lat**, **Long**

98.23%

[Details](#)

### Try it out!

Bedroom

Bathroom

Den

Lat

Long

[Predict](#)



### A.I. predicts

Price  
4000

- ❖ Now let's save the model.
- ❖ Now click on the continue button.
- ❖ Give apartmentRentPriceModel for the name of the model.

Predict **Price** based on **Bedroom**, **Bathroom**, **Den**, **Lat**, **Long**

Model name (required)

- ❖ Now click on the save button.
- ❖ Then the details of the model we created will be displayed as below.
- ❖ The details of the model we created are displayed as follows.



| apartmentRentPriceModel  |                                                          |
|--------------------------|----------------------------------------------------------|
| Accuracy                 | 98.23%                                                   |
| Intended Use             |                                                          |
| Limitations and Warnings |                                                          |
| About the Data           | Dataset size<br>1124 rows                                |
| Features and Label       | Predict Price based on Bedroom, Bathroom, Den, Lat, Long |
| Label                    | Price<br>Possible Values<br>min 65<br>max 535000         |
| Features                 | Bedroom<br>Possible Values<br>min 1<br>max 3<br>Bathroom |

- ❖ Now click on Finish button.